

WHAT IS CLAIMED IS:

1. An ink jet printer head, comprising:
a plurality of ejector units each of which includes (a) a cavity unit which has a plurality of nozzles provided in an outer surface thereof and arranged in a reference direction, a plurality of ink chambers which communicate with the plurality of nozzles, respectively, and in each of which an ink is accommodated, and a plurality of ink channels communicating with the plurality of nozzles via the plurality of ink chambers, respectively, and (b) an actuator which applies an energy to said each of the ink chambers so as to eject a droplet of the ink from a corresponding one of the nozzles via a corresponding one of the ink channels; and

a frame member having at least one ink supply passage through which the ink is supplied from at least one ink supply source to the ejector units, the ejector units being fixed in position to the frame member,

the cavity unit of said each of the ejector units including a channel unit having the ink chambers and the ink channels, and a nozzle sheet having the nozzles arranged in the reference direction, the nozzle sheet of said each ejector unit being fixed in position to the channel unit thereof,

the nozzle sheet of said each ejector unit having, in two end portions thereof that are opposite to each other in the reference direction, two first positioning holes, respectively, into which two first positioning pins of a first jig are inserted when

the nozzle sheet of said each ejector unit is fixed to the channel unit thereof,

the nozzle sheet of said each ejector unit additionally having, in said two end portions thereof, two second positioning holes, respectively, into which corresponding two second positioning pins out of a plurality of pairs of second positioning pins of a second jig are inserted when the ejector units are fixed to the frame member,

the channel unit of said each ejector unit having two first blind holes in communication with the two first positioning holes, respectively, and two second blind holes in communication with the two second positioning holes, respectively, the two first positioning pins of the first jig being inserted via the two first positioning holes into the two first blind holes, respectively, when the nozzle sheet of said each ejector unit is fixed to the channel unit thereof, the two second positioning pins of the second jig being inserted via the two second positioning holes into the two second blind holes, respectively, in a state in which the nozzle sheet of said each ejector unit is fixed to the channel unit thereof.

2. The ink jet printer head according to claim 1, wherein one of the two first positioning holes of the nozzle sheet of said each ejector unit is a circular hole, and the other first positioning hole is an elongate hole having a width substantially equal to a diameter of the one of the two first positioning holes, and wherein one of the two second positioning holes of the nozzle sheet of said each ejector unit is a circular hole and the other

second positioning hole is an elongate hole having a width substantially equal to a diameter of the one of the two second positioning holes.

3. The ink jet printer head according to claim 1, wherein each of the first and second blind holes of the channel unit of said each ejector unit has a cross section greater than a cross section of a corresponding one of the first and second positioning holes of the nozzle sheet of said each ejector unit.

4. The ink jet printer head according to claim 1, wherein the frame member has a bottom wall to which the plurality of ejector units are fixed such that the plurality of ejector units extend parallel to each other.

5. The ink jet printer head according to claim 1, wherein the frame member has a bottom wall including a plurality of support portions which support respective back surfaces of the plurality of ejector units such that a plurality of portions of the back surface of said each ejector unit are exposed in a plurality of through-holes of the bottom wall, respectively, and wherein the through-holes of the bottom wall are filled with an adhesive so as to fix said each ejector unit to the frame member.

6. The ink jet printer head according to claim 1, wherein each of the respective nozzle sheets of the plurality of

ejector units has the plurality of nozzles arranged in at least one array in the reference direction, and the plurality of ejector units are fixed to the frame member such that the respective arrays of nozzles of the plurality of ejector units are parallel to each other and distant from each other by a predetermined distance.

7. An ejector unit for use in an ink jet printer head including a frame member having at least one ink supply passage through which an ink is supplied from at least one ink supply source to the ejector unit, the ejector unit being fixed to the frame member, the ejector unit comprising:

a cavity unit which has a plurality of nozzles provided in an outer surface thereof and arranged in a reference direction, a plurality of ink chambers which communicate with the plurality of nozzles, respectively, and in each of which the ink is accommodated, and a plurality of ink channels communicating with the plurality of nozzles via the plurality of ink chambers, respectively; and

an actuator which applies an energy to said each of the ink chambers so as to eject a droplet of the ink from a corresponding one of the nozzles via a corresponding one of the ink channels,

the cavity unit including a channel unit having the ink chambers and the ink channels, and a nozzle sheet having the nozzles arranged in the reference direction, the nozzle sheet being fixed in position to the channel unit,

the nozzle sheet having, in two end portions thereof

that are opposite to each other in the reference direction, two first positioning holes, respectively, into which two first positioning pins of a first jig are inserted when the nozzle sheet is fixed to the channel unit,

the nozzle sheet additionally having, in said two end portions thereof, two second positioning holes, respectively, into which corresponding two second positioning pins out of a plurality of pairs of second positioning pins of a second jig are inserted when a plurality of ejector units including the ejector unit are fixed to the frame member,

the channel unit having two first blind holes in communication with the two first positioning holes, respectively, and two second blind holes in communication with the two second positioning holes, respectively, the two first positioning pins of the first jig being inserted via the two first positioning holes into the two first blind holes, respectively, when the nozzle sheet is fixed to the channel unit, the two second positioning pins of the second jig being inserted via the two second positioning holes into the two second blind holes, respectively, in a state in which the nozzle sheet is fixed to the channel unit.

8. The ejector unit according to claim 7, wherein the channel unit includes a base sheet having the ink chambers, and a plurality of channel sheets which cooperate with each other to define the ink channels and the first and second blind holes, the base sheet and the channel sheets being stacked on each other to provide a stacked body, and wherein the nozzle sheet

having the nozzles is fixed to the stacked body by inserting the two first positioning pins via the two first positioning holes of the nozzle sheet, respectively, into the two first blind holes of the stacked body, respectively.

9. An ink jet printer head, comprising:

a plurality of ejector units each of which has a plurality of nozzles, a plurality of ink chambers which communicate with the plurality of nozzles, respectively, and in each of which an ink is accommodated, a plurality of ink channels communicating with the plurality of nozzles via the plurality of ink chambers, respectively, and an actuator which applies an energy to said each of the ink chambers so as to eject a droplet of the ink from a corresponding one of the nozzles via a corresponding one of the ink channels;

the cavity unit of said each of the ejector units including a channel unit having the ink chambers and the ink channels, and a nozzle sheet having the nozzles, the channel unit and the nozzle sheet of said each ejector unit being fixed to each other; and

the nozzle sheet of said each ejector unit having two first positioning holes, and two second positioning holes.

10. The ink jet printer head according to claim 9, wherein the nozzle sheet of said each ejector unit is elongate, and has the two first positioning holes in lengthwise opposite end portions thereof, respectively, and has the two second positioning

holes in the lengthwise opposite end portions thereof, respectively, wherein one of the two first positioning holes is a circular hole and the other first positioning hole is an elongate hole, and wherein one of the two second positioning holes is a circular hole and the other second positioning hole is an elongate hole.

11. The ink jet printer head according to claim 10, wherein the channel unit of said each ejector unit has two first relief holes in communication with the two first positioning holes, respectively, and two second relief holes in communication with the two second positioning holes, respectively, and wherein one of the two first relief holes is a circular hole and the other first relief hole is an elongate hole, and wherein one of the two second relief holes is a circular hole and the other second relief hole is an elongate hole.

12. The ink jet printer head according to claim 11, wherein a diameter of the circular first relief hole is greater than a diameter of the circular first positioning hole, and a diameter of the circular second relief hole is greater than a diameter of the circular second positioning hole, and wherein a width of the elongate first relief hole is greater than a width of the elongate first positioning hole, and a width of the elongate second relief hole is greater than a width of the elongate second positioning hole.

13. The ink jet printer head according to claim 9,

wherein the channel unit of said each ejector unit has two first relief holes which communicate, when the channel unit and the nozzle sheet of said each ejector unit are fixed to each other, with the two first positioning holes of the nozzle sheet and allow two first positioning pins to enter the two first relief holes via the two first positioning holes, respectively, and additionally has two second relief holes which communicate, in a state in which the channel unit and the nozzle sheet of said each ejector unit are fixed to each other, with the two second positioning holes of the nozzle sheet and allow two second positioning pins to enter the two second relief holes via the two second positioning holes, respectively.

14. A method of manufacturing an ink jet printer head including (a) a plurality of cavity units each of which has a plurality of nozzles, a plurality of ink chambers which communicate with the plurality of nozzles, respectively, and in each of which an ink is accommodated, and a plurality of ink channels communicating with the plurality of nozzles via the plurality of ink chambers, respectively, and (b) a plurality of actuators each of which applies an energy to each of the ink chambers of a corresponding one of the cavity units so as to eject a droplet of the ink from a corresponding one of the nozzles via a corresponding one of the ink channels, the method comprising the steps of:

preparing a plurality of nozzle sheets each of which has the plurality of nozzles, two first positioning holes, and two

second positioning holes,

preparing a plurality of channel units each of which has the plurality of ink chambers to accommodate the ink and communicate with the plurality of nozzles, respectively, of a corresponding one of the nozzle sheets, and the plurality of ink channels to communicate with the plurality of nozzles of said corresponding nozzle sheet via the plurality of ink chambers, respectively,

causing two first positioning pins of a first jig to fit in the two first positioning holes of said each of the nozzle sheets so as to position said each nozzle sheet relative to the first jig,

fixing said each nozzle sheet positioned relative to the first jig, and a corresponding one of the channel units, to each other, so as to provide a corresponding one of the cavity units,

causing a first pair of second positioning pins of a second jig to fit in the two second positioning holes of the nozzle sheet of a first one of the cavity units, and causing a second pair of second positioning pins of the second jig to fit in the two second positioning holes of the nozzle sheet of a second one of the cavity units, so that the first and second cavity units are positioned relative to the second jig and are thereby positioned relative to each other, and

fixing the first and second cavity units positioned relative to each other, to a frame member.

15. The method according to claim 14, wherein the step of preparing the channel units comprises preparing the

channel units each of which has two first relief holes to communicate, when said each channel unit and said corresponding one of the nozzle sheets are fixed to each other, with the two first positioning holes of said corresponding nozzle sheet and allow the two first positioning pins of the first jig to enter the two first relief holes via the two first positioning holes, respectively, and additionally has two second relief holes which communicate, in a state in which said each channel unit and said corresponding nozzle sheet are fixed to each other, with the two second positioning holes of said corresponding nozzle sheet and allow a corresponding one pair of second positioning pins out of the first and second pairs of second positioning pins of the second jig to enter the two second relief holes via the two second positioning holes, respectively.

16. The method according to claim 14, wherein the step of preparing the channel units comprises preparing the channel units said each of which has the first and second relief holes each of which has a cross section greater than a cross section of a corresponding one of the first and second positioning holes of said corresponding one nozzle sheet, said each channel unit additionally having two third positioning holes at respective positions distant from each other in a reference direction in which the nozzles of said corresponding nozzle sheet are arranged, and wherein the step of causing the two first positioning pins of the first jig to fit in the two first positioning holes of said corresponding nozzle sheet comprises causing the

two first positioning pins of the first jig to fit in the two first positioning holes of said corresponding nozzle sheet so as to position said corresponding nozzle sheet relative to the first jig and simultaneously causing two third positioning pins of the first jig to fit in the two third positioning holes of said each channel unit so as to position said each channel unit relative to the first jig and thereby position said each channel unit and said corresponding nozzle sheet relative to each other.